

Health Advisory:

Polio Infection

October 7, 2005

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Health Advisory
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FROM: JULIA M. ECKSTEIN
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SUBJECT: **Polio Infection in an Unvaccinated Infant
Minnesota, October, 2005**

The Minnesota Department of Health (MDH) has identified a vaccine-derived type 1 poliovirus in a 7-month old immunocompromised infant from a largely unvaccinated community. The infant was hospitalized in late August in the Twin Cities area for failure to thrive and diarrhea. The infant has no paralytic disease. A stool specimen sent to MDH laboratory was positive for a type 1 poliovirus. Molecular testing (Polymerase Chain Reaction - PCR) by the Minnesota Department of Health (MDH) laboratory identified this type 1 poliovirus strain as vaccine-derived; that is, a strain initially in live attenuated oral polio vaccine (OPV).

The MDH laboratory and CDC believe this strain has been replicating for 1 to 2 years and over time, it has mutated and reverted to a strain that is similar to wild poliovirus in terms of transmissibility and risk of paralytic disease. The U.S. has not used OPV since 2000, and Canada has not used OPV for routine immunization since 1997. Thus the source of this strain is likely a person who received OPV in another country. OPV continues to be widely used in many other countries, especially those involved in polio eradication.

Concurrent community and hospital investigations lead by MDH are ongoing. The goals of the investigations are 1) to identify the source of this virus, and whether there is evidence of virus circulating in the community and/or possible nosocomial transmission, and 2) to provide vaccine to healthcare workers and potentially exposed community members who are unvaccinated or incompletely vaccinated against polio.

The infant, who is from a generally unvaccinated MN community, has had multiple hospitalizations since July and is now hospitalized in the Twin Cities area. The infant was likely infected by exposure to someone else shedding this virus; other people may have been infected before it spread to the infant. It is unknown whether and if yes, for how long, this strain has circulated in MN or the U.S. but not for more than two years.

Other persons could contract poliovirus from this infant through contact with stool or oral secretions. Widespread transmission in a vaccinated community is unlikely because fully vaccinated individuals are not at risk of disease from this or other polioviruses. However, immunized individuals may become re-infected and shed the virus for up to two weeks.

The risk of transmission in unvaccinated communities is higher. CDC recommends state and local health departments assess polio immunization coverage in their communities and provide opportunities for unvaccinated persons to receive IPV.

The last outbreak of polio in the United States occurred in 1979 among unvaccinated Amish persons living in Iowa, Missouri, Pennsylvania, and Wisconsin. Live attenuated OPV caused about eight cases of vaccine-associated paralytic polio a year in the U.S. from 1980-96 and fewer cases from 1997-1999 as the U.S. implemented a sequential IPV-OPV schedule. To eliminate this risk, OPV was phased out from 1997-2000 and is no longer used in the U.S. Inactivated (injectable) polio vaccine (IPV) currently used in the U.S. which does not contain live virus, should be effective against this strain.

Poliomyelitis

Poliomyelitis, or polio, is a vaccine-preventable disease caused by the poliovirus, which leads to a viral infection. Polio occurs worldwide. However, no cases of wild polio virus have been reported in the U.S. since 1979. In 2003 only 784 confirmed cases of polio were reported globally and polio was endemic in 6 countries. The World Health Organization and the Centers for Disease Control and Prevention have a goal of eradicating polio throughout the world by 2010.

Polio can be a very serious disease, causing permanent paralysis and even death. However, up to 95 percent of all polio infections are inapparent or asymptomatic. Infected persons without symptoms shed virus in the stool and are able to transmit the virus to others. The incubation period for poliomyelitis is commonly 6-20 days with a range from 3 to 35 days. The response to poliovirus infection is categorized according to severity.

Approximately 4-8 percent of polio infections consist of a **minor, nonspecific illness** without clinical or laboratory evidence of central nervous system invasion. Complete recovery usually occurs in less than a week. This form of the disease is usually characterized by upper respiratory infection such as sore throat and fever; gastrointestinal disturbances such as nausea, vomiting, abdominal pain, constipation, and, rarely, diarrhea; and influenza-like illness.

Nonparalytic aseptic meningitis (symptoms of stiffness of the neck, back, and/or legs), usually following several days after a prodrome similar to that of minor illness, occurs in one-two percent of polio infections. Increased or abnormal sensations can also occur. Typically these symptoms will last from two to ten days, followed by complete recovery.

Less than one percent of all polio infections result in **flaccid paralysis**. Paralytic symptoms generally begin one to ten days after the first symptoms and progress for two to three days. Generally, no further paralysis occurs after the temperature returns to normal. Many persons with paralytic poliomyelitis recover completely and, in most, muscle function returns to some degree. Weakness or paralysis still present twelve months after onset is usually permanent.

Paralytic polio is classified into three types, depending on the level of involvement. **Spinal polio** is most common, and accounted for 79 percent of paralytic cases from 1969 to 1979. It is characterized by asymmetric paralysis that most often involves the legs. **Bulbar polio** accounted for

two percent of cases and led to weakness of muscles innervated by cranial nerves. **Bulbospinal polio** accounted for nineteen percent of cases and was a combination of bulbar and spinal paralysis.

The death rate for children is 2–5 percent in children and up to 15–30 percent in adults (depending on age). It increases to 25–75 percent with bulbar polio.

There are no medications that can cure the infection, but symptoms can be relieved while the disease runs its course.

To prevent poliomyelitis, the polio immunization should be administered. Two types of polio vaccine are available: oral polio vaccine (OPV) and inactivated polio vaccine (IPV). OPV, which is made with a live, but weakened, virus, is no longer used in the U.S. because in rare instances it causes vaccine-associated paralytic polio (VAPP). From 1980 through 1999, there were 144 confirmed cases of VAPP. In order to eliminate VAPP from the United States, ACIP recommended in 2000 that IPV be used exclusively in the United States. The last case of VAPP was reported in 1999.

Please contact your doctor, local health department or the Department of Health and Senior Services (573-751-6439 or 800-392-0272) if you have other questions about poliomyelitis.